# DISPENSER FOR RELEASING TREATMENT COMPOSITION INTO A TOILET BOWL

This invention relates to a dispenser for releasing a treatment composition into a toilet bowl, and also for releasing fragrance into the surrounding room. It also relates to a method of manufacture of such a dispenser.

Chemical compositions for treating the water in a toilet bowl, for example for cleaning the bowl, disinfecting it, or reducing lime scale build up, are well known, and may be dispensed from a solid block of the composition material. Further, gels or other solid vehicles for fragrance compositions are used in toilets to provide regular dispensing of a fragrance into the toilet room, over a protracted period. It is also known, for example from WO 03/042462 to provide a dispenser both for the treatment composition and also for the fragrance composition. The two types of composition are contained in separated chambers in a housing which hangs from the rim of the toilet. Once the toilet is flushed, water falls from the toilet rim into the bowl and some of the water flows through the housing, dissolving some of the treatment composition in its chamber. The treatment composition is thus dispensed periodically, whenever the toilet is flushed. The fragrance is allowed to permeate into the room continuously, and the housing is positioned to protect the fragrance containing gel from the flushing water.

One aim of the present invention is to provide a dispenser for treatment composition and for fragrance, with a simple construction which may be manufactured easily and provide improved performance.

Accordingly, one aspect of the present invention provides a dispenser for releasing a treatment composition into a toilet, and a fragrance into the surrounding room, comprising: a first block of the treatment composition; a second block of material impregnated with the fragrance; and a housing with apertures for admitting water into

the housing and for allowing the water to drain out of the housing, and having an interior space to house the block of the treatment composition for contact with the water; the housing holding the fragrance block such that the fragrance block plugs an opening in a wall of the housing and allows one major surface of the fragrance block to be exposed to the exterior of the housing and an opposed major surface of fragrance block to be in fluid communication with the interior space of the housing to allow it to emit fragrance through the housing apertures.

By allowing the inner surface of the fragrance block to communicate with the atmosphere through the apertures, the effective surface area from which the fragrance evaporates is nearly doubled, compared with arrangements in which only one surface is exposed. Further, by allowing the fragrance block to be in communication with the interior of the housing, there is no need for a barrier between two chambers of the housing, as is considered necessary in WO 03/042462.

To facilitate holding of second block the housing may be a hollow shell and the wall opening have a flange extending inwardly of the shell, the flange supporting an edge of the fragrance block between its opposed major surfaces. The flange may have a projection extending into the opening for locating the fragrance block. The flange may have projections extending inwardly of the housing beyond the inner major surface of the fragrance block, for spacing it apart from the treatment composition block.

The wall opening may be in one side of the housing which is upright in use, and the apertures for admitting water and allowing it to drain may be separated from the wall opening so that the fragrance block is not in the direct flow path of water between those apertures. This reduces the likelihood of fragrance being washed into the flush water. With the wall opening in one side of the housing which is upright in use, and the apertures for admitting water and allowing it to drain separated from the wall opening, the flange can shield the edge of the fragrance block from the water.

A hanger may be provided, joined to the housing for removably hanging it from a rim of a toilet bowl.

The hanger may be joined to the housing at a wall which supports the fragrance block.

The housing may have internal plinth formations for supporting a base of the treatment block in use to allow the flow of water underneath it.

The fragrance block and the wall opening may have an irregular outline shape. The fragrance block may be formed with a decorative pattern on its outer major surface. The fragrance block may be formed of materials of two or more contrasting colours to form a visible pattern on its outer major surface.

The housing may be a plastics one-piece moulding. The housing may be formed from a hinged clam-shell one-piece plastics moulding, one portion of which consists of the wall plugged by the fragrance block.

In a particular aspect of the invention, the fragrance block comprises a gel.

The gel may comprise a polymer matrix having the fragrance dispersed therein.

The gel may be formulated to plug the wall opening and shrink as the fragrance evaporates but continue to plug the wall opening.

The treatment composition forming the first block may comprise one or more of a colourant, a surfactant and a bleach.

The dispenser may be produced by moulding the fragrance material into the wall opening.

The housing may be formed from a hinged clam-shell one-piece plastics moulding, one portion of which consists of the wall plugged by the fragrance block, the clam-shell moulding is then closed around the fragrance block, about its hinge, to secure it together.

Another aspect of the invention provides a dispenser for releasing a treatment composition into the bowl of a toilet, and a fragrance into the surrounding room, comprising: a first block of the treatment composition a second block of material impregnated with the fragrance; and a housing configured externally to be hung, in use, from the rim of the toilet, and with apertures for admitting water into the housing when the toilet is flushed and for allowing the water to drain out of the housing into the bowl, and having an interior space to house the block of the treatment composition for contact with the water; the housing holding the fragrance block such that the fragrance block plugs an opening in a wall of the housing and allows one major surface of the fragrance block to be exposed to the exterior of the housing and an opposed major surface of fragrance block to be in fluid communication with the interior space of the housing to allow it to emit fragrance through the housing apertures.

Other preferred features and advantages of the invention will be apparent from the accompanying claims and the following description.

In order that the invention may be better understood, preferred embodiments thereof will be now described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a side view of a dispenser embodying the invention;

Figure 2 is a vertical cross-section through the dispenser of Figure 1;

Figure 3 is a front view of the dispenser of Figure 1;

Figure 4 is a perspective view from the rear and one side, of the dispenser of Figure 1;

Figure 5 is a perspective view of a plastics moulding before it is folded into the configuration shown in Figure 1;

Figure 6 is a perspective view from the front of part of the dispenser of Figure 1, showing a patterned fragrance block, and

Figure 7 is a perspective view of an embodiment of the invention for use with a Japanese style toilet cistern.

A dispenser 10 consists of a hollow housing 8 connected to a hanger 11. The hanger is shaped in the form of a coil to be removably hung from the rim of a toilet, so that the housing 8 hangs downwards as shown in Figures 1 to 4. It grips the rim by resilient deformation of the coil as well known. A leg portion 11 formed integrally with the housing, and projecting radially from a front face 21 of the housing, has a socket 14 which receives one end of a coil portion 12 of which a tip 15 is tapered for easy insertion. A line of notches 13 allows vertical adjustment of the coil 12 within the socket 14, to allow adjustment of the vertical length to suit toilets of different shape. The function of the hanger is to place the housing directly into the flow of water into the toilet bowl when the toilet is flushed. As shown in Figure 2, in cross-section view, the housing has a flat front face 21 connected to a rear bowl 26 comprising a curved sidewall 29 with a flattened upper portion 30, and a slightly curved rear wall 31. As shown more clearly opened out in Figure 5, the housing is formed from a one piece plastics moulding in the form of a clam shell, hinged at 32, and closed with a snap fit by inter-engaging formations 33 on the two clam shell halves. As shown in Figures 2 and 4 most clearly, the housing has a rearwardly projecting lip 41 forming a scoop or trough with an upwards facing opening slot 42, for trapping water travelling downwardly from the rim. Such water is guided into the housing which then is allowed to fill. For US style systems in which the flush water flows down the surface of the toilet bowl, the housing may be positioned with the lip 41 against the bowl surface. The lip may be extended outwards to facilitate this. Further, a row of four arcuate slots 43, 44, 45 and 46 is provided in the rear vertical face 31, for admitting flushing water into the housing. Further still a row of four straight apertures 47, 48, 49 and 50 is provided along the upper wall 30 of the housing, for admitting flushing water.

A pair of small apertures 51 are provided adjacent the hinge 32 at the base of the housing, for allowing water to drain slowly from the housing once flushing is complete. Such water will contain a dissolved portion of the treatment composition which is held in a solid block 28 within the housing. In this example, the small apertures 51 are

formed by u-shaped notches 51a and 51c in the edge of the rear portion of the clam shell moulding, which cooperate with corresponding notches 51b and 51d in the other clam shell half, as shown in Figure 5.

The interior of the lower wall 26 of the housing is formed with a series of four parallel plinth projections 27, shown in Figures 2 and 5, for supporting the treatment block 28 and allowing the flow of water beneath it. To the rear, the treatment block 28 will abut against the inner surface of the housing. To the front, the treatment block 28 is held away from a fragrance block 24 by a series of castellations 25, typically 1 to 4mm in height, shown in Figures 2 and 5, formed as inward projections on a flange 22 which extends inwardly from an opening in the front wall 21. The castellations 25 serve to space the front surface of the treatment block 28 from the fragrance block 24 which fills or plugs the aperture 9 in the front wall 21, as shown in Figures 2 and 6. This allows water to flow around the entire surface of the treatment block 28, and to touch the rear surface of the fragrance block 24, and allows fragrance to evaporate from the rear face of the block 24, interior of the housing.

As shown most clearly in Figures 2 and 5, the flange 22 extends inwardly transverse to the front face 21 of the wall, and supports and protects the edge of the fragrance block 24 between its two opposed major surfaces. A shoulder or ledge 23 extends inwardly from the flange 22, parallel to the front surface 21 of the wall, for locating the fragrance block 24. Flange 22 may be continuous or may be a series of short lengths or spikes. A continuous flange is preferred to maintain contact with the edge of the fragrance block as or if it shrinks when the fragrance evaporates.

In this example, the housing is about 60mm high by 60mm wide by 40mm deep and the hanger length is adjustable between about 50mm and 80mm.

A typical gel impregnated with fragrance, forming the fragrance block 24, will shrink, as the fragrance evaporates during use, by about 1mm around its perimeter, in the radial direction. For this reason, the shoulder 23 has to be sufficiently wide to accommodate such shrinkage in use, whilst still retaining the gel block 24 and plugging the aperture. By way of comparison, the shrinkage from front to back of the gel block 24 may

typically be less than 0.5mm each side for a block which is 6 to 8 mm. thick. The degree of shrinkage will depend on the polymer matrix forming the gel, and the volume percentage of perfume in the gel.

The apertures in the housing are separate, transversely, from the vertical major surface or the fragrance block 24, but water will still cascade over the front face of the housing and the block 24 in turbulent flow toilet systems. The block may be in contact briefly with water trapped in the housing, which will contain dissolved constituents of block 28, but with appropriate choice of materials, such as a hydrophobic gel and fragrance for block 24, this exposure is insufficient to cause significant washing of fragrance composition into the water.

The composition of the treatment block may be one of those well known in the art and for example as described in WO 03/042462. Such compositions may include one or more of a colourant, a surfactant, a bleach or other disinfectant, and a limescale inhibitor or remover. A composition comprising a surfactant and/or a colourant is particularly preferred.

Preferred block formulations are, in % by weight:

Example A

| | |
|---|---|
| Sodium Alkylaryl sulfonate(80%) | 40 |
| Sodium alpha-olefin sulfonate (80% active) | 20 |
| Coco monoethanolamide | 5 |
| Alcohol ethoxylate | 5 |
| Sodium sulfate | balance |

Example B

| | |
|---|---|
| Sodium Alkylaryl sulfonate(80%) | 26 |
| Sodium alpha-olefin sulfonate | 12 |
| Sodium Secondary alkane sulfonate | 5 |
| Hydrophobes | 5 |
| Sodium sulfate | balance |

Example C

| | |
|---|---|
| Sodium Alkylaryl sulfonate(80%) | 40 |
| Sodium alpha-olefin sulfonate | 20 |
| Coco monoethanolamide | 5 |
| Hydrophobes | 5 |
| Sodium sulfate | balance |

To maximise the active ingredients in the block the amount of hydrophobe is reduced, and the quantity of water entering the housing is limited by the size of the apertures in the housing wall to reduce the rate of solubilisation of the block.

When using a bleach containing block 28, the amount of bleach which needs to be contained in the block, and hence dissolved, can be minimised by restricting the outflow of water from the housing so that the majority of the water in the housing will flow into the bowl after the bowl contents have been replenished by the flush water.

Suitable fragrance containing gel formulations are as described in WO 02/066084, particularly at examples 1 to 7.

Preferred formulations have a range of 30% to 70% by weight fragrance in a polymer gellant such as ETPA (ester terminated polyamide) as in WO 98/17243 or ATPA. About 50% by weight ETPA or ATPA polymer gellant and 50% by weight fragrance oil with a colourant is particularly preferred.

The required rigidity of the gel will depend in part on the size of the aperture in the housing wall. Thus a sinuous outline to the aperture is preferred to provide a large area but maintain a smaller span in at least one direction across the aperture. The aperture may be spanned by supporting ribs which may be encased within the gel body or be exposed to provide a part of the decorative effect. A honeycomb or grid type structure may also be provided for gels which are less self supporting.

As shown in Figures 5 and 6, the outline of the aperture in the front wall 21 is of an irregular shape, in this case a "swirl" which is intended to add aesthetic merit to the overall design. Further, the gel composition from which the fragrance block is made could for example include two or more different contrasting colours, formed in a colour pattern, for aesthetic effect. Further still, the outer surface may be embossed with a shape, such as the dimples 61 of different sizes, to provide a further aesthetic effect.

For more rigid gels, the gel may be formed with apertures in the gel, thus increasing the exposed surface area of the gel for more enhanced fragrance release.

The dispenser may be packaged in a blister pack of the type known for such toilet products. The dispenser is then clipped over the rim of the toilet, so that it hangs vertically, with the housing in line with the flow of water during flushing. The front face 21 faces inwards in the toilet. Whenever the toilet is then flushed, water passes into the housing and then drains slowly from the housing, the period of dwell of that water being sufficient to allow some of the treatment composition in the treatment block to be dissolved into the water. Due to the relatively short period, typically about 10 seconds after the initiation of the flushing, during which the treatment block is exposed to the water, only a limited, reasonably controlled amount is dissolved. Further, due to this relatively short period, the effect of any water contacting the inner surface of the fragrance block is minimal.

The inner surface of the fragrance block 24 is continuously exposed to the air in the housing, which allows fragrance vapour to emerge through the apertures into the room surrounding the toilet. At the same time, there is a continuous spread of vapour from the external surface of the fragrance block 24 into the room. Thus the effective surface area of the fragrance block is a large part of its total surface area, excluding the edge which is in contact with the flange 22.

In this example, the dispenser is intended to be disposable at end of life. This may be indicated by the disappearance of the block, or more easily by using a treatment block containing a dye or surfactant, the absence of colour or foam in the toilet bowl

indicating the end of life. When the fragrance is depleted, it is preferred that the matrix of the fragrance block remain, plugging the aperture in the housing front wall.

The dispenser is manufactured as follows. The one-piece plastic moulding shown in Figure 5 is produced by injection moulding substantially in the configuration shown in Figure 5. It is then placed over a puck such that the puck engages the front face 21 of that clam shell half. The fragrance gel in liquid form is poured into the moulding chamber formed by the puck and the flange 22, with the level rising higher than the shoulder 23, to form the gel block 24 which is then allowed to solidify. Typically, the puck is polished and thermally conductive, preferably of aluminium, and preferably it has a raised boss approximately 1mm high, complementary in shape with the aperture. By raising the surface, this ensures correct registration of the puck with the housing wall 21, and the gel is prevented from leaking during the moulding process. An alternative would be for the puck to have a recess engaged by a boss in the housing shell.

The puck may be embossed or otherwise formed to provide the required patterns in the surface of the gel block. A three dimensional surface to the gel will provide increased evaporation rate of the fragrance. Different nozzles may be provided for different colours of gel, to give a desired aesthetic effect by mixing colours. The puck may have upstands which extend through the thickness of the gel layer, to form through apertures in the moulded gel block.

Once the gel has set and the puck has separated from the clam shell, a treatment block is dropped into the rearward half shell 29, and the clam shell is closed by folding it about its hinge 32, until the inter-engaging formations 33 close it with a snap fit. The housing is then closed except for the apertures which admit water.

It will be appreciated that alternative materials may be used for the fragrance block, other than gels; the block however has to be sufficiently rigid to act as a plug for the aperture.

Further, the dispenser could adopt different shapes and configurations, and it need not have a carrier 11, for example if it could be wedged effectively under the toilet rim by other means.

For Japanese style toilets in which water flows from an open tap into the top of the toilet cistern, the housing may be supported on top of the cistern, on legs for example. The treatment composition of block 28 thus being washed into the cistern. One such embodiment is shown in Figure 7. A plastics housing is a clam shell type having upper and lower halves 102, 104. Legs 106 depend down from lower housing half 104 to locate the dispenser in the drainage aperture provided on top of a Japanese style toilet cistern, as well known in the art. A solid block 28 rests inside the housing 100 on lower half 104. Apertures 108 allow water to enter the upper half of 102 to contact block 28 and exit through lower half apertures 110. A block 24 of fragrance impregnated gel fills a heart shaped aperture 112 in the upper surface 114 of upper housing half 102. Gel block 24 provides an attractive appearance as well as the perfume fragrance. The perimeter of aperture 112 may be configured as for the perimeter of aperture 9 in the first embodiment with a flange defining the periphery of the aperture 114 and a shoulder extending inwards from the flange for location of the gel block 24 as shown in the detail cross-section in Figure 7.

Depending on the direction and flow of the flushing water, the arrangement of apertures shown is intended to be used with most commercially available toilets, but it will be appreciated that other arrangements will be possible, including those appropriate to particular types of toilet bowl.